1076214

INSTRUCTIONS

his spreadsheet is designed to record the raw fiber counts for air and dust samples analyzed by TEM

This is version TEM32d

Raw Data Recording

Raw data are to be recorded by the analyst in hard copy using Lab sheet 1 and as many Lab Continuation pages as needed

Data Entry

Data on the hard copy lab sheets are to be entered electronically on data entry sheets 1 and 2

Areas for data entry are highlighted in **YELLOW**

OR are indicated by a **PULL-DOWN MENU**

Cells that are shaded gray do not require any data input

Cells that are shaded red either require data input or contain an apparent data inconsistency

Do not enter data in any other location!

Avoid the drag and drop method for copying.
Enter all values individually

File Save

After entering all data on Data Entry 1 (or any time thereafter), SAVE THE FILE by clicking on the macro button located on data Entry 1 or Data Entry 2.

The file name is generated automatically by concatinating information provided in Data Entry 1, inc

a) EPA Index ID, b) Lab Sample Number, c) Counting Rule, d) Analysis Date, e) Prep method, and

For example, if the EPA number is **2-012345** and the lab ID number is **abc-1234**, the method is **AHERA**, the analysis date is **03-04-01**, the prep method is **Direct**, and the QA type is **Recount Same**
the file name will be: "**2-012345_abc-1234_AHERA_03-04-01_DRS.XLS**"

opened:
--if you open EXCEL and then open the TEM EDD, the new file will be saved in the same directory as the TEM EDD.
--if you open the TEM EDD from Explorer, then the file will be saved in you default directory for Excel (usually this is C:\Documents and Settings\My Documents)

TEM - General Counting Rules
Follow established project-specific counting and stopping rules.
Do not count non-asbestos material (NAM) structures.

ISO 10312 Counting Rules:
The lab analyst is responsible for identifying if a Bundle (B) is countable (i.e., substructures within have an aspect ratio greater than or equal to the specified aspect ratio).
Aspect ratio rules do not apply to compact clusters, compact matrices, or residuals.
If a structure is non-countable (e.g.: crosses the top or left grid bar), it should be identified with a "0" in the Total column.
All countable structures should be identified with a non-zero sequential number in the Total column. Enter a non-zero sequential number for any unique primary structure in the first row only. If there are multile rows associated with the primary structure, it is not necessary to repreat the primary number in every row.
NOTE: Data Entry 2, column R is designed to flag any potential data entry errors associated with countable/non-countable assignments.

AHERA/ASTM Counting Rules:
Valid Structure Types are Fiber (F), Matrix (M), Cluster (C), and Bundle (B).
For Matrices (M), record the dimensions of the protrusion, not the matrix.
Note: Currently, the spreadsheet will incorrectly exclude one particular class of matrix structure from the AHERA binned results summary -- a matrix for which a protruding bundle has an aspect ratio less than 5:1, but the underlying fibrils meet the aspect ratio requirement. This is a limitation of the TEM spreadsheet.
If this type of structure is encountered, the analyst should note this issue in the analysis comments.
The lab analyst is responsible for identifying if a Cluster (C) or Bundle (B) is countable (i.e., substructures within have an aspect ratio greater than the specified aspect ratio).
Do not record non-countable structures.
All countable structures should be identified with a non-zero sequential number in the Total column.
NOTE: Data Entry 2, column R is designed to flag any potential data entry errors associated with countable/non-countable assignments.

DATA ENTRY INSTRUCTIONS

Data Item	Description	Notes
DATA ENTRY 1		
File Type	Correction/revision status of the file	Select the appropirate File Type (original, correction 1, correction 2, correction 3, correction 4) from the pull-down list. The filename will be automatically updated to reflect the correction status (i.e., "_C1" suffix will be added to the "correction 1" file). It is not necessary to manually change the filename.
Laboratory Name	Name of lab performing analysis	Use a standard name for all sheets.
Instrument	Instrument used for analysis	
Voltage (KV)	Voltage used for analysis	
Magnification	Magnification used for analysis	
Grid opening area	Size of grid opening	Enter as a value in units of mm^2. This field should not contain any text.
Scale: 1L =	Scale adjustment factor for length	Enter 1.0 if dimensions are expressed as um. Otherwise, enter um per unit screen length.
Scale: 1D =	Scale adjustment factor for width	Enter 1.0 if dimensions are expressed as um. Otherwise, enter um per unit screen width.
Primary filter area	Size of primary effective filter area (EFA)	Enter as a value in units of mm^2. This field should not contain any text.
Secondary filter area	Size of secondary effective filter area (EFA)	Enter as a value in units of mm^2. This field should not contain any text.
Category	Sample type	Select the appropriate category (Field, Replicate, Duplicate, Blank) from the pull-down list.
Filter Status	Status of the sample filter	Select the appropriate category (Analyzed, Overloaded, Damaged, Missing, Cancelled) from the pull-down list.
EPA Index ID	Unique sample identifier	Enter the EPA Index ID exactly as it appears on the sample (ie: 2-00013). This field should not contain any spaces or a lab QA type suffix.
Sample Type	Sample media	Select the appropriate category (Air, Dust, Dustfall) from the pull-down list.
Air volume (L), dust area (cm2), or dustfall container area (cm2)	Air volume (L), dust area (cm2), or dustfall container area (cm2)	If the sample media is air, enter the air volume in units of L. If the sample media is dust, enter the dust sample area in units of cm^2. If the sample media is dustfall, enter the dustfall container area in units of cm^2. This field should not contain any text.
Date Received	Date sample was received by lab	Enter as a valid date with the format MM/DD/YY.
Lab Job Number	Job number assigned to analysis by lab	
Lab Sample Number	Sample identifier as designated by lab	If the sample is a lab QA Type, DO NOT add the QA suffix to the Lab Sample ID. If the file has been corrected or modified, DO NOT add "REV" to the Lab Sample ID. Use the File Type pull-down list to note the revision status.
Number of grids prepared	Number of grids prepared by lab	
Prepared by	Name of lab preparation personnel	Enter as first initial and last name (J. Smith)
Preparation date	Date sample was prepared	Enter as a valid date with the format MM/DD/YY.
EPA COC Number	EPA chain of custody number	
Analyzed by	Name of analyst	Enter as first initial and last name (J. Smith)
Date Analyzed	Date sample was analyzed by lab	Enter as a valid date with the format MM/DD/YY.
Prep	Analysis Prep Type	Select the appropriate Prep type (Direct, Indirect, Indirect - Ashed) from the pull-down list.
Loose Material in the Cowl?	Is there loose material or debris in the cowl?	If the sample media is air, select either "yes" or "no" from the pull-down list.
Counting Rules	Counting Rules utilized to analyze sample	Select the appropriate Counting Rule from the pull-down list. If the sample media is dust, select either ASTM-AHERA or ISO. If the sample media is air, select either AHERA or ISO.
Grid Storage Location	Grid storage location identifier	
F-factor Calculation:		For Direct prep, f-factor is set to equal 1 and specific f-factor calculations are not required.
Indirect Prep inputs:		
Fraction of primary filter used		Enter the fraction as a value. This field should not contain any text.
First resuspension volume or rinsate volume (mL)		Enter as a value in units of mL. This field should not contain any text.
Volume applied to secondary filter (mL) or used for serial dilution		Enter as a value in units of mL. This field should not contain any text.
Inputs for Serial Dilutions:		
Second resuspension volume (mL)		Enter as a value in units of mL. This field should not contain any text.
Volume applied to secondary filter (mL) or used for serial dilution		Enter as a value in units of mL. This field should not contain any text.
Third resuspension volume (mL)		Enter as a value in units of mL. This field should not contain any text.
Volume applied to secondary filter (mL) or used for serial dilution		Enter as a value in units of mL. This field should not contain any text.
Inputs for Ashing of Secondary Filter: [Note: only complete this cell if the SECONDARY filter was ashed. Leave blank if the primary filter was ashed.]		
Fraction of secondary filter used		Enter the fraction as a value. This field should not contain any text.
QA Type	Lab quality control code	Select the appropriate laboratory QA type (Not QA, Recount Same, Recount Different, Repreparation, Verified Analysis, Reconciliation, Lab Blank, Interlab) from the pull-down list.
Comments	Sample/Analysis comments	
Recording Rules:		
Minimum Aspect Ratio	Minimum aspect ratio of structures that are to be recorded	Select the appropriate minimum aspect ratio (none, ≥ 3:1, ≥ 5:1) from the pull-down list.
Minimum Length	Minimum length of structures that are to be recorded	Enter as a value in units of um. If no minimum length is specified, enter 0.00.
Minimum Width	Minimum width of structures that are to be recorded	Enter as a value in units of um. If no minimum length is specified, enter 0.00.
Stopping Rules (stop if any one of the following criteria are met):		
Target Sensitivity	Target sensitivity	Enter as a value in units of s/cc for air or s/cm^2 for dust or dustfall. This field should not contain any text. If no target sensitivity is required, leave this field blank.
Maximum # of GOs	Maximum # of GOs	Enter as a value. This field should not contain any text. If no maximum # of GOs has been established, leave this field blank.
Maximum # of Structures	Target # of structures	Enter as a value. This field should not contain any text. If no target # of structures is required, leave this field blank.
DATA ENTRY 2		
Data Entry by	Name of data enty personnel	Enter as first initial and last name (J. Smith)
Data Entry Date	Date results were entered	Enter as a valid date with the format MM/DD/YY.
QA by	Name of QA personnel	Enter as first initial and last name (J. Smith)
QA Date	Date results were QAed	Enter as a valid date with the format MM/DD/YY.
Grid	Grid identifier	Enter the appropriate grid in the first row only. If there are multiple rows associated with the grid, it is not necessary to repeat the grid in every row.
Grid Opening	Grid opening location identifier	Enter the appropriate grid opening in the first row only. If there are multiple rows associated with the grid opening, it is not necessary to repeat the grid opening in every row. Indicate grid openings that **DO NOT** count crysotile with an "*" following the grid opening name (eg: A-4*). Indicate grid openings that **COUNTED ONLY A FRACTION OF THE GO** for crysotile with an "!" following the grid opening name (eg: A-4!). If only a fraction of the total GO was counted for chrysotile, you must enter the fraction of the GO counted in the appropriate column (Fract. GO Chrys.).
Structure Type	Structure Type code	Enter the structure type code. For ISO, see the analytical method for valid structure type codes. For AHERA, valid structure types are Fiber (F), Matrix (M), Cluster (C), and Bundle (B).
Primary	Primary Structure identifier	For ISO, enter a non-zero sequential number for any unique primary structure in the first row only. If there are multile rows associated with the primary structure, it is not necessary to repreat the primary number in every row. This field is not used for AHERA or ASTM.
Total	Total Structure identifier	Assign a "0" to any non-countable or excluded structure and a non-zero number to any countable structure. ***See specific instructions above for details on populating this field for ISO and AHERA/ASTM.*
Length	Structure length	Enter dimensions either in absolute units (um) or in screen units.
Width	Structure width	Enter dimensions either in absolute units (um) or in screen units.
Identification	Identification	
Mineral Class	Description of the structure mineral class type	Enter a "1" in the appropriate column; choices include "LA" (Libby amphibole), "OA" (other amphibole), "C" (chrysotile). You may only select one mineral class type for each structure. *NOTE: Do not enter "NAM" (non-asbestos material) structures.*
Comments	Structure comments	
Sketch	Sketch	Enter a "1" in this column if yes, otherwise leave this field blank.
Photo	Photo	Enter a "1" in this column if yes, otherwise leave this field blank.
EDS	EDS	Enter a "1" in this column if yes, otherwise leave this field blank.
Fract. GO Chrys.	Fraction of GO counted for Chrysotile	If only a fraction of the GO was counted for crysotile, enter the fraction counted as a value between 0 and 1 (eg: if only 1/4 of the GO was counted for chrysotile, the value entered would be 0.25).

Enter Project Name Here: LIBBY

LIBBY

TEM Asbestos Structure Count

Laboratory name:	RESI
Instrument	JEOL 100 CX
Voltage (KV)	100 KV
Magnification	20,000
Grid opening area (mm2)	0.011
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	201
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.45

EPA Sample Number:	
Sample Type (A=Air, D=Dust, DF = Dustfall):	
Air volume (L), dust area (cm2), or dustfall container area (cm2)	
Date received by lab	
Lab Job Number:	
Lab Sample Number:	
Number of grids prepared	3
Prepared by	
Preparation date	
EPA COC Number:	
Secondary filter pore size (um)	0.22

Analyzed by	
Analysis date	
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	
Counting rules (ISO, AHERA, ASTM)	
Grid storage location	
Archive filter(s) storage location	
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):

none ≥ 3:1 ≥ 5:1

Minimum Length (um):

Minimum Width (um):

Stopping Rules:

Target Sensitivity:

Max # of GOs:

Target # of Structures:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing *[For dust and dustfall, enter 1.0]*
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing

LA = Libby-type amphibole OA = Other (non-Libby type) amphibole C = Chrysotile NAM = Non-asbestos material

LIBBY

TEM Asbestos Structure Count

LAB NAME		EPA SAMPLE NO.		QA TYPE		LAB JOB NUMBER	
LAB SAMPLE NO.		SAMPLE TYPE				GRID STORAGE LOC.	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Sketch/Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	

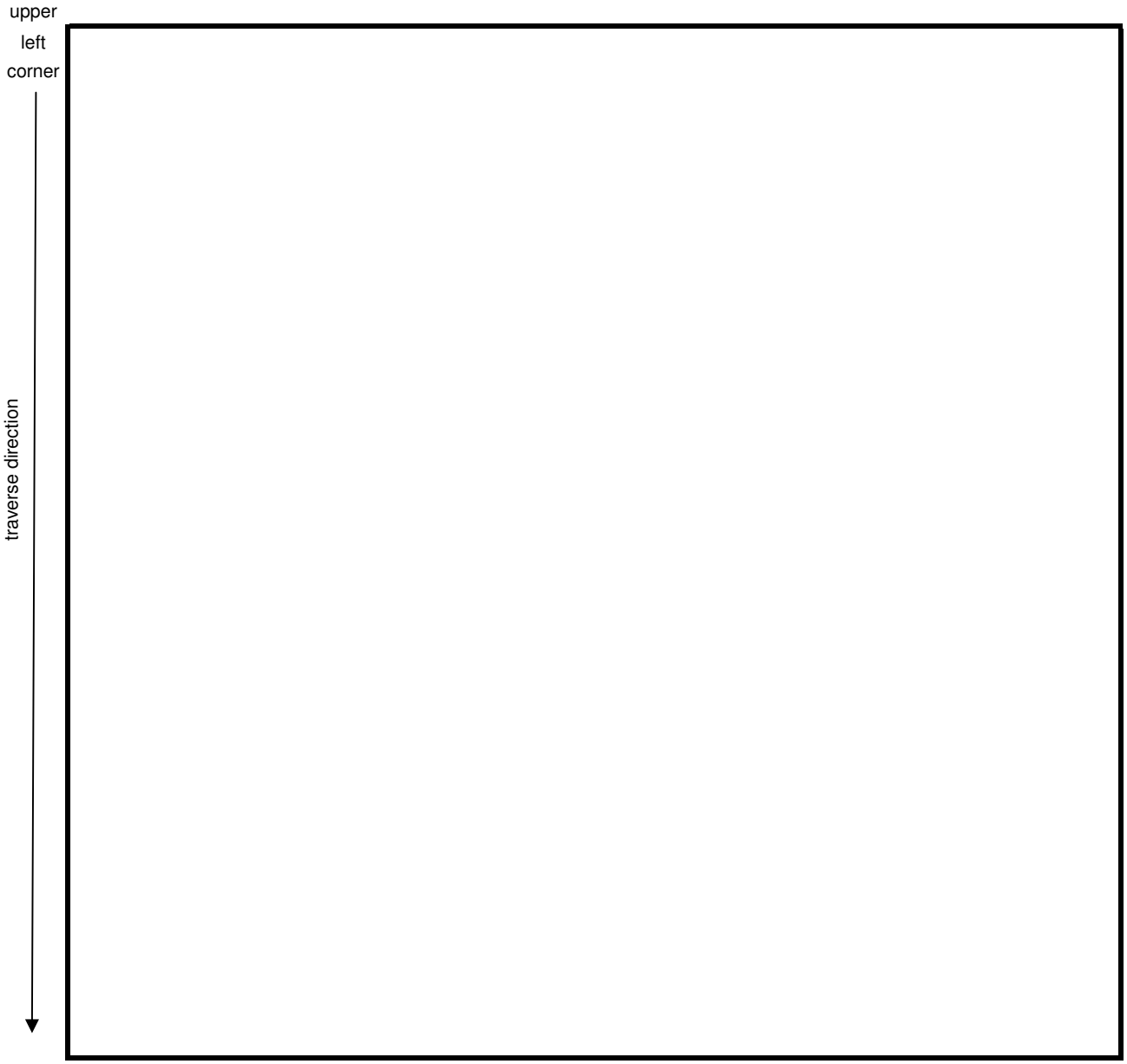
STRUCTURE LOCATIONS WITHIN GRID OPENING

Lab Name: _____ Lab Job Number: _____

Index ID: _____ Lab Sample ID: _____

Lab QC Type (circle one): Reprep for interlab Interlab

Grid: _____ Grid Opening: _____



Comments:

FILE NAME: FC-00007_143576-176058_ISO_10-20-07_IA.xls

FILE TYPE: Original

LIBBY

TEM Asbestos Structure Count

Laboratory name:	RESI	EPA Sample Number:	FC-00007	Analyzed by	A. Heitger
Instrument	JEOL 100 C X	Sample Type	Air	Analysis date	10/20/2007
Voltage (KV)	100KV	Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1200	Prep	Indirect - Ashed
Magnification	20,000	Date received by lab	8/27/2007	If sample type = air, is there loose material or debris in the cowl?	Yes
Grid opening area (mm2)	0.0110	Lab Job Number:	143576	Counting rules	ISO (Air or Dust)
Scale: 1L =	0.280	Lab Sample Number:	143576-176058	Grid storage location	143576
Scale: 1D =	0.056	Number of grids prepared	3	Archive filter(s) storage location	143576
Primary filter area (mm2)	385.0	Prepared by	ND/KS/CL	*Enter the appropriate data in the cells to the right to calculate the F-factor >>>>>*	
Secondary Filter Area (mm2)	346.0	Preparation date	9/20/2007	F- factor	0.1
Category	Field	EPA COC Number	L12730	QA Type	Not QA
Filter Status	Analyzed				

COMMENTS

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
0.00	Minimum Width (um)

Stopping Rules:

0.00100	Target Sensitivity
263	GOs required to reach target sensitivity
100	Maximum # of GOs
50	Maximum # of Structure
100	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

1	Fraction of primary filter used for indirect prep or ashing *[For dust and dustfall, enter 1.0]*
100	First resuspension volume or rinsate volume (mL)
10	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

1	Fraction of secondary filter used for ashing

0.1	F-factor

LIBBY
TEM Asbestos Structure Count

EPA SAMPLE ID:	FC-00007	Sample Type	Air	Prep	Indirect - Ashed	*ERROR CHECK*	
LAB SAMPLE ID:	143576-176058	Count Rule	10312	QA Type	Not QA	**ERROR - Check Values**	
Data Entry by:	S. Gardalen	QA by:	G. Vettraino				
Data Entry date:	11/7/2007	QA date:	11/7/2007				

Maximum # of Structures Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
A	F3-3	MD11	1													
		MF		1	29	6	ADX	1				WRTA, NaK	1		1	
		F	0	0	21	12	ADX					High Al & Ca	1	1	1	
		F	2	2	8	8	ADX	1				WRTA, NaK	1	1	1	
		MD11	3													
		MF		3	89	10	ADX	1				WRTA, Nak	1		1	
	E3-3	B	4	4	20	8	ADX	1				AT, XK	1	1	1	
		MD11	5													
		MF		5	25	4	ADX	1				WRTA, Nak	1			
		MD10	6													
		MF		6	15	5	ADX	1				WRTA, NaK	1			
		MD10	7													
		MF		7	6	3	ADX	1				WRTA, NaK	1			
		F	8	8	5.5	5	ADX	1				AT, XK	1			
		MD10	9													
		MB		9	13	12	ADX	1				WRTA, NaK	1		1	
		MD10	0													
		MB		0	5	4	ADX				1	UN	1		1	
	C3-3	MD11	10													
		MF		10	53	6	ADX	1				AT,XX	1			
		MD10	11													
		MF		11	7	6	ADX	1				WRTA, NaK	1			
	G4-1	MD10	12													
		MF		12	3	4	ADX	1				WRTA, NaK	1			
		F	0	0	8	6	ADX				1	UN	1		1	
		MD11	13													
		MF		13	54	7	ADX	1				WRTA, NaK	1			
		MD11	14													
		MF		14	41	11	ADX	1				WRTA, NaK	1			
		F	15	15	63	5	ADX	1				WRTA, NaK	1			
	F4-6	F	16	16	15	9	ADX	1				WRTA, NaK	1			
		F	17	17	8	4	ADX	1				WRTA, NaK	1			
		MD11	18													
		MB		18	86	19	ADX	1				WRTA, NaK	1			
		MD10	19													

		MF		19	12	4	ADX	1				WRTA, NaK	1			
		B	20	20	4	4	ADX	1				AT, XX	1			
		F	21	21	8	9	ADX	1				WRTA, NaK	1		1	
		F	22	22	4	5	ADX	1				WRTA, NaK	1			
		F	0	0	2.5	5	ADX				1	High Ca	1	1	1	
	E5-4	MD10	23													
		MF		23	15	11	ADX	1				AT, XX	1			
		MD10	24													
		MF		24	5	5	ADX	1				WRTA, NaK	1			
		B	25	25	25	19	ADX	1				WRTA, NaK	1			
		MD11	26													
		MF		26	20	3	ADX	1				WRTA, NaK	1			
		F	27	27	12.5	6	ADX	1				WRTA, NaK	1			
B	G3-3	B	28	28	4.5	6	ADX	1				WRTA, NaK	1			
		B	29	29	25	18	ADX	1				WRTA, NaK	1			
	F3-3	MD10	30													
		MB		30	8	5	ADX	1				WRTA, NaK	1			
	C3-6	MD10	0													
		MF		0	4	7	ADX	1				WRTA, NaK <3:1	1			
		F	31	31	19	7	ADX	1				WRTA, NaK	1	1		
	G4-1	B	32	32	18	29	ADX	1				AT, XX	1		1	
		F	33	33	9	4	ADX	1				WRTA, NaK	1			
		MD11	34													
		MB		34	21	13	ADX	1				AT, XK	1			
		MD11	35													
		MF		35	15.5	7	ADX	1				AT, XK	1			
		F	36	36	5.5	3	ADX	1				WRTA, NaK	1			
		F	37	37	7	8	ADX	1				WRTA, NaK	1			
	F4-1	F	38	38	6	10	ADX	1				WRTA, XK	1			
		MF11	39													
		MF		39	21	8	ADX	1				WRTA, NaK	1			
		MF10	40													
		MF		40	6	7	ADX	1				WRTA, NaK	1			
		MD11	41													
		MF		41	62	5	ADX	1				WRTA, NaK	1			
		F	42	42	8	2	ADX	1					1			
		MD10	43													
		MF		43	14	14	ADX	1				WRTA, NaK	1			
	G5-3	MD10	44													
		MF		44	17	3	ADX	1				WRTA, NaK	1			
		F	45	45	7	1	ADX	1				WRTA, NaK	1			
		MD10	46													
		MF		46	13.5	2	ADX	1				WRTA, NaK	1			
		F	0	0	5.5	13	ADX	1				WRTA, NaK < 3:1	1			
		B	47	47	14	15	ADX	1				WRTA, NaK	1			
		MD11	48													
		MF		48	61	5	ADX	1				WRTA, NaK	1			

		F	49	49	6	9	ADX	1				WRTA, NaK	1			
		F	50	50	23	9	ADX	1				WRTA, NaK	1			
		F	51	51	9	5	ADX	1				WRTA, NaX	1			
		MD20	52													
		MF		52	4	1	CD			1			1	1		
		MR		53	6	4	CD			1			1			

Source File	Lab name	Instrument	Voltage	Mag	GO area	EFA	EPA No.	Date rec.	Lab Job No.	Lab Sample No.	COC Number	Category	No. grids prepared	Prep by	Prep date	Anal. by	Anal. date	Prep	Method	Rule	F- factor	Comment	GO Counted	QA Type	Filter Status	GO-Chrys	EDD Version	Revision #	Vol (L) or Area (cm2)	Sample Type	Grid storage location	Data Entry by	Data Entry Date	QA by	QA Date	Counting Rule_AR min	Counting Rule_L min	Counting Rule_W min	Stopping Rule_S	Stopping Rule_GO	Stopping Rule_N	Loose Material?	Archive filter storage location	Indirect_Filtration primary filter	Aliquot1	Vol1	Indirect Ashing_Fraction secondary filter	Aliquot2	Vol2	Aliquot3	Vol3
B-176058.JEC	RESI	JEOL 100 C X	100KV	20000	0.0110	346.0	FC-00007	8/27/2007	143576	143576-176058	L12730	Field	3	ND/KG/CL	9/20/2007	A. Hedges	10/20/2007	Indirect - Ashed	TEM	10312	1.00E-01		12	Not QA	Analyzed	12	3bt	0	1200	Air	143576	S. Gendaken	11/7/2007	G. Vatrenis	11/7/2007	≥ 2:1	0.50	0.00	0.001	1.00	30	Yes	143576	1.00	10	100	1.00				

Source File	Index	Grid	Grid Opening	Structure Type	Primary	Total	L	W	AR	Class	Identification	Sketch	Photo	EDS	Comment	Fract. GO Chrys.
FC-00007	1	A	F3-3	MD11	1											
FC-00007	2	A	F3-3	MF		1	8.1	0.3	24.2	LA	ADX	1		1	WRTA, NaK	
FC-00007	3	A	F3-3	F	0	0	5.9	0.7	8.8		ADX	1	1	1	High Al & Ca	
FC-00007	4	A	F3-3	F	2	2	2.2	0.4	5.0	LA	ADX	1	1	1	WRTA, NaK	
FC-00007	5	A	F3-3	MD11	3											
FC-00007	6	A	F3-3	MF		3	24.9	0.6	44.5	LA	ADX	1		1	WRTA, Nak	
FC-00007	7	A	E3-3	B	4	4	5.6	0.4	12.5	LA	ADX	1	1	1	AT, XK	
FC-00007	8	A	E3-3	MD11	5											
FC-00007	9	A	E3-3	MF		5	7.0	0.2	31.3	LA	ADX	1			WRTA, Nak	
FC-00007	10	A	E3-3	MD10	6											
FC-00007	11	A	E3-3	MF		6	4.2	0.3	15.0	LA	ADX	1			WRTA, NaK	
FC-00007	12	A	E3-3	MD10	7											
FC-00007	13	A	E3-3	MF		7	1.7	0.2	10.0	LA	ADX	1			WRTA, NaK	
FC-00007	14	A	E3-3	F	8	8	1.5	0.3	5.5	LA	ADX	1			AT, XK	
FC-00007	15	A	E3-3	MD10	9											
FC-00007	16	A	E3-3	MB		9	3.6	0.7	5.4	LA	ADX	1		1	WRTA, NaK	
FC-00007	17	A	E3-3	MD10	0											
FC-00007	18	A	E3-3	MB		0	1.4	0.2	6.3	NAM	ADX	1		1	UN	
FC-00007	19	A	C3-3	MD11	10											
FC-00007	20	A	C3-3	MF		10	14.8	0.3	44.2	LA	ADX	1			AT,XX	
FC-00007	21	A	C3-3	MD10	11											
FC-00007	22	A	C3-3	MF		11	2.0	0.3	5.8	LA	ADX	1			WRTA, NaK	
FC-00007	23	A	G4-1	MD10	12											
FC-00007	24	A	G4-1	MF		12	0.8	0.2	3.8	LA	ADX	1			WRTA, NaK	
FC-00007	25	A	G4-1	F	0	0	2.2	0.3	6.7	NAM	ADX	1		1	UN	
FC-00007	26	A	G4-1	MD11	13											
FC-00007	27	A	G4-1	MF		13	15.1	0.4	38.6	LA	ADX	1			WRTA, NaK	
FC-00007	28	A	G4-1	MD11	14											
FC-00007	29	A	G4-1	MF		14	11.5	0.6	18.6	LA	ADX	1			WRTA, NaK	
FC-00007	30	A	G4-1	F	15	15	17.6	0.3	63.0	LA	ADX	1			WRTA, NaK	
FC-00007	31	A	F4-6	F	16	16	4.2	0.5	8.3	LA	ADX	1			WRTA, NaK	
FC-00007	32	A	F4-6	F	17	17	2.2	0.2	10.0	LA	ADX	1			WRTA, NaK	
FC-00007	33	A	F4-6	MD11	18											
FC-00007	34	A	F4-6	MB		18	24.1	1.1	22.6	LA	ADX	1			WRTA, NaK	
FC-00007	35	A	F4-6	MD10	19											
FC-00007	36	A	F4-6	MF		19	3.4	0.2	15.0	LA	ADX	1			WRTA, NaK	
FC-00007	37	A	F4-6	B	20	20	1.1	0.2	5.0	LA	ADX	1			AT, XX	
FC-00007	38	A	F4-6	F	21	21	2.2	0.5	4.4	LA	ADX	1		1	WRTA, NaK	
FC-00007	39	A	F4-6	F	22	22	1.1	0.3	4.0	LA	ADX	1			WRTA, NaK	
FC-00007	40	A	F4-6	F	0	0	0.7	0.3	2.5	NAM	ADX	1	1	1	High Ca	
FC-00007	41	A	E5-4	MD10	23											
FC-00007	42	A	E5-4	MF		23	4.2	0.6	6.8	LA	ADX	1			AT, XX	
FC-00007	43	A	E5-4	MD10	24											
FC-00007	44	A	E5-4	MF		24	1.4	0.3	5.0	LA	ADX	1			WRTA, NaK	
FC-00007	45	A	E5-4	B	25	25	7.0	1.1	6.6	LA	ADX	1			WRTA, NaK	
FC-00007	46	A	E5-4	MD11	26											
FC-00007	47	A	E5-4	MF		26	5.6	0.2	33.3	LA	ADX	1			WRTA, NaK	
FC-00007	48	A	E5-4	F	27	27	3.5	0.3	10.4	LA	ADX	1			WRTA, NaK	
FC-00007	49	B	G3-3	B	28	28	1.3	0.3	3.8	LA	ADX	1			WRTA, NaK	
FC-00007	50	B	G3-3	B	29	29	7.0	1.0	6.9	LA	ADX	1			WRTA, NaK	
FC-00007	51	B	F3-3	MD10	30											
FC-00007	52	B	F3-3	MB		30	2.2	0.3	8.0	LA	ADX	1			WRTA, NaK	
FC-00007	53	B	C3-6	MD10	0											
FC-00007	54	B	C3-6	MF		0	1.1	0.4	2.9	LA	ADX	1			WRTA, NaK <3:1	
FC-00007	55	B	C3-6	F	31	31	5.3	0.4	13.6	LA	ADX	1	1		WRTA, NaK	
FC-00007	56	B	G4-1	B	32	32	5.0	1.6	3.1	LA	ADX	1		1	AT, XX	
FC-00007	57	B	G4-1	F	33	33	2.5	0.2	11.3	LA	ADX	1			WRTA, NaK	
FC-00007	58	B	G4-1	MD11	34											
FC-00007	59	B	G4-1	MB		34	5.9	0.7	8.1	LA	ADX	1			AT, XK	
FC-00007	60	B	G4-1	MD11	35											
FC-00007	61	B	G4-1	MF		35	4.3	0.4	11.1	LA	ADX	1			AT, XK	
FC-00007	62	B	G4-1	F	36	36	1.5	0.2	9.2	LA	ADX	1			WRTA, NaK	
FC-00007	63	B	G4-1	F	37	37	2.0	0.4	4.4	LA	ADX	1			WRTA, NaK	
FC-00007	64	B	F4-1	F	38	38	1.7	0.6	3.0	LA	ADX	1			WRTA, XK	
FC-00007	65	B	F4-1	MF11	39											
FC-00007	66	B	F4-1	MF		39	5.9	0.4	13.1	LA	ADX	1			WRTA, NaK	
FC-00007	67	B	F4-1	MF10	40											
FC-00007	68	B	F4-1	MF		40	1.7	0.4	4.3	LA	ADX	1			WRTA, NaK	
FC-00007	69	B	F4-1	MD11	41											
FC-00007	70	B	F4-1	MF		41	17.4	0.3	62.0	LA	ADX	1			WRTA, NaK	
FC-00007	71	B	F4-1	F	42	42	2.2	0.1	20.0	LA	ADX	1				
FC-00007	72	B	F4-1	MD10	43											
FC-00007	73	B	F4-1	MF		43	3.9	0.8	5.0	LA	ADX	1			WRTA, NaK	
FC-00007	74	B	G5-3	MD10	44											
FC-00007	75	B	G5-3	MF		44	4.8	0.2	28.3	LA	ADX	1			WRTA, NaK	
FC-00007	76	B	G5-3	F	45	45	2.0	0.1	35.0	LA	ADX	1			WRTA, NaK	
FC-00007	77	B	G5-3	MD10	46											
FC-00007	78	B	G5-3	MF		46	3.8	0.1	33.8	LA	ADX	1			WRTA, NaK	
FC-00007	79	B	G5-3	F	0	0	1.5	0.7	2.1	LA	ADX	1			WRTA, NaK < 3:1	
FC-00007	80	B	G5-3	B	47	47	3.9	0.8	4.7	LA	ADX	1			WRTA, NaK	
FC-00007	81	B	G5-3	MD11	48											
FC-00007	82	B	G5-3	MF		48	17.1	0.3	61.0	LA	ADX	1			WRTA, NaK	
FC-00007	83	B	G5-3	F	49	49	1.7	0.5	3.3	LA	ADX	1			WRTA, NaK	
FC-00007	84	B	G5-3	F	50	50	6.4	0.5	12.8	LA	ADX	1			WRTA, NaK	
FC-00007	85	B	G5-3	F	51	51	2.5	0.3	9.0	LA	ADX	1			WRTA, NaX	
FC-00007	86	B	G5-3	MD20	52											
FC-00007	87	B	G5-3	MF		52	1.1	0.1	20.0	C	CD	1	1			
FC-00007	88	B	G5-3	MR		53	1.7	0.2	7.5	C	CD	1				

LIBBY Version 32d

TEM Asbestos Structure Count -- Not AHERA

SAMPLE ID	
Status	Analyzed
EPA Sample Number	FC-00007
QA Sample Type	Not QA
Lab Sample Number	143576-176058
Sample Type	Air
Category	Field
Prep	Indirect - Ashed
Counting rules	10312

PARAMETERS	
Number of Grid Openings (amphibole)	12
Number of Grid Openings (chrysotile)	12
Area of grid opening (mm2)	0.011
F Factor	1.00E-01
Effective primary filter area (mm2)	385.0
Effective secondary filter area (mm2)	346.0
Volume (L) or Sample Area (cm2)	1200
Area counted (mm2) for LA/OA	0.132
Area counted (mm2) for C	0.132

Recording Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	0

Stopping Rules:

Target S	Max GOs	Max N
0.001	263	50

TOTAL COUNTS

Total Structures	Not AHERA
Total Asbestos structures	Not AHERA
Total NAM	Not AHERA
Total Not AHERA structures	Not AHERA
Total Non-Not AHERA asbestos structures	Not AHERA

COUNTS (based on countable Not AHERA structures only)

	LA	OA	C	Total
Not AHERA Structures (< 5 um)	32	0	2	34
Not AHERA Structures (>= 5 um)	19	0	0	19

AIR CONCENTRATION (s/cc)

	LA	OA	C	Total	
Loading on primary filter (s/mm2)	3.5E+03	<6.8E+01	1.4E+02	3.6E+03	(if Total = ND, DL is based on LA)
Air Conc (s/cc)	1.1E+00	<2.2E-02	4.4E-02	1.2E+00	(if Total = ND, DL is based on LA)

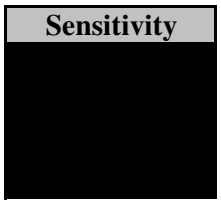
DETECTION LIMITS

	LA/OA	C
Loading on primary filter (s/mm2)	6.8E+01	6.8E+01
Sensitivity (s/cc)	2.2E-02	2.2E-02

******DO NOT USE AHERA UPLOAD SHEET******

Note: Currently, the spreadsheet will incorrectly exclude one particular class of matrix structure from the AHERA binned results summary -- a matrix for which a protruding bundle has an aspect ratio less than 5:1, but the underlying fibrils meet the aspect ratio requirement. This is a limitation of the TEM spreadsheet. If this type of structure is encoutered, the analyst should note this issue in the analysis comments.

Mineral Class	S<5u	S>5u	Q_ASBL	ASBL	Q_ASBC	ASBC


Sensitivity

LIBBY

TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status	Analyzed
EPA Sample Number	FC-00007
QA Type	Not QA
Lab Sample Number	143576-176058
Sample Type	Air
Category	Field
Prep	Indirect - Ashed
Counting Rules	10312

PARAMETERS

Effective filter area	346.0	mm2
Indirect factor	1.00E-01	
Number of Grid Openings (amphibole)	12	
Number of Grid Openings (chrysotile)	12	
Grid opening area	0.0110	mm2
Volume (L) or Area (cm2)	1200	L
Sensitivity (amphibole)	2.18E-02	s/cc
Sensitivity (chrysotile)	2.18E-02	s/cc

Recording Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	0

Stopping Rules:

Target S	Max GOs	Max N
0.001	100	50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	10	0	0		
b	0	0	0		
c	11	0	0		
d	19	0	2		
e	6	0	0		
f	5	0	0		
Total	51	0	2	17	17
Check	OK	OK	OK		
Grand total	53	OK			

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	2.18E-01	<DL	<DL		
b	<DL	<DL	<DL		
c	2.40E-01	<DL	<DL		
d	4.15E-01	<DL	4.37E-02		
e	1.31E-01	<DL	<DL		
f	1.09E-01	<DL	<DL		
Total	1.11E+00	<DL	4.37E-02	3.71E-01	3.71E-01

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Mineral Class	A_count	B_count	C_count	D_count	E_count	F_count	G_count
LA	10	0	11	19	6	5	51
OA	0	0	0	0	0	0	0
C	0	0	0	2	0	0	2

Sensitivity	A_conc	B_conc	C_conc	D_conc	E_conc	F_conc
2.18E-02	2.18E-01	<DL	2.40E-01	4.15E-01	1.31E-01	1.09E-01
2.18E-02	<DL	<DL	<DL	<DL	<DL	<DL
2.18E-02	<DL	<DL	<DL	4.37E-02	<DL	<DL

G_conc
1.11E+00
<DL
4.37E-02